~2002年 7月 8日 15時00分~

R SHIN-YOKOHAMA

ⁿNO. 1282

197484US-557-557-0

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

YASUO SUZUKI ET AL

: EXAMINER: J. DOTE

SERIAL NO. 09/679,480

FILED: OCTOBER 5, 2000

: GROUP ART UNIT: 1753

FOR: ELECTROPHOTOGRAPHIC

PHOTORECHPTOR AND

ELECTROPHOTOGRAPHIC IMAGE

FORMING METHOD AND APPARATUS USING THE

PHOTORECEPTOR

ASSISTANT COMMISSIONER FOR PATENTS WASHINGTON, D.C. 20231

SIR:

Lague Suguhu, the undersigned, who deposes and states Now comes_ that:

1. I am a graduate of	Johoku University	and received my
master deg	ree in the year <u>/983</u>	

2. I have been employed by R	icoh Company Limited for 15 years as
a development engineer	in the field of electrophotography

- 3. I am an inventor in the above-identified application.
- 4. I have read and understand U.S. Patent 6,136,483 to Suzuki et al ("Suzuki").

comparative examples are described below in paragraphs 6-12.

- 5. In order to more clearly show the differences in black spot formation between the examples and comparative examples in the above-identified application and <u>Suzuki</u>'s examples, the formulation and evaluation methods for the respective examples and
 - 6. Examples 8 to 15 of Suzuki

Substrate: a cylinder having a diameter of 80 mm and a length of 359 mm

(Undercoat layer)

Formulation: titanium oxide/alkyd-melamine resin

Solvent: methyl ethyl ketone

Thickness: 4.5 µm

Drying condition: 130 °C, 20 minutes

(Charge generation layer)

Formulation: asymmetric disazo pigment/r-form metal-free

phthalocyanine/butyral resin (S-lec BL-1) = 4/2/2.4 by weight

Solvent cyclohexanone

Thickness: 0.2 µm

Drying condition: 130 °C, 10 minutes

(Charge transport layer)

Formulation: hydrazone compound (Examples 8 and 9)/Z-form

polycarbonate = 7/10

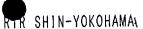
stilbene compound (Examples 10 to 15)

Solvent: tetrahydrofuran

Thickness: 25 µm

Drying condition: 130 °C, 15 minutes

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(Evaluation method)

Image forming apparatus: IMAGIO MF530

Environmental condition: 25 °C 50% RH

Original document: a chart having an image area of 5%

Number of produced copies: 50,000 sheets (successively produced)

Evaluation method of black spot; the number of copies in which a black spot of 0.1 mm or larger is present in an area of 1 cm².

7. Comparative Examples 5 and 13 in the Present Application

Substrate: a cylinder having a diameter of 30 mm and a length of 340 mm

(Undercoat layer)

Formulation: titanium oxide/alkyd-melamine resin

Solvent: methyl ethyl ketone

Thickness: 3.0 µm

Drying condition: 130 °C, 20 minutes

(Charge generation layer)

Formulation: asymmetric disazo pigment/r-form metal-free

phthalocyanine/butyral resin (S-lec BM-S) = 4/3/1.4 by weight

Solvent: cyclohexanone

Thickness: 0.2 µm

Drying condition: 130 °C, 10 minutes

(Charge transport layer)

Formulation: stilbene compound/Z-form polycarbonate = 7.5/10

Solvent: toluene

Thickness: 28 µm

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Drying condition: 130 °C, 25 minutes

(Evaluation method)

Image forming apparatus: IMAGIO MF250

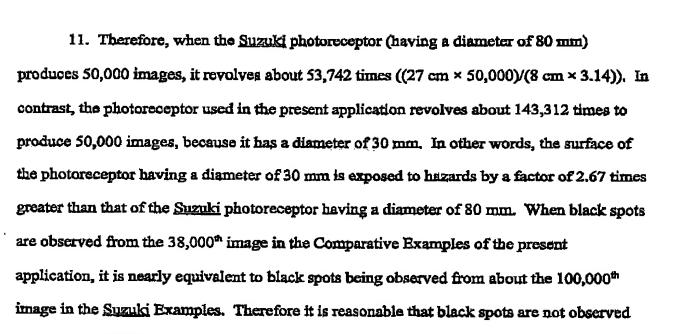
Environmental condition: 25 °C 50 %RH

Original document: a chart having an image area of 5 %

Number of produced copies: 50,000 sheets (successively produced)

Evaluation method of black spot: the number of copies in which a black spot of 0.1 mm or larger is present in an area of 1 cm²

- 8. Black spots were not observed even in the 50,000th copy image in the <u>Suzuki</u>
 Examples, but black spots were observed in the 38,000th image (or 35,000th image) in the
 Comparative Examples of the present application. The reasons for this are discussed in paragraphs 9-12 below.
- One reason is that the undercoat layer, which is thicker in the <u>Suzuki</u> Examples
 (4.5 μm) than in the present Comparative Examples (3.0 μm), has a charge blocking property. The thicker the undercoat layer, the better the black spot resistance.
- 10. More importantly, the reason for the difference in black spot formation is the difference in the respective photoreceptor diameters used in <u>Suzuki</u> and the present application. The diameter of the photoreceptors used in <u>Suzuki</u> is 80 mm, but the diameter of the photoreceptors used for the Comparative Examples in the present application is 30 mm. A-4 sized copies were used in both <u>Suzuki</u> and the present application, although this is not described in either the present application or <u>Suzuki</u>. With an A-4 sized copy, a length of about 27 cm is needed for each photoreceptor to produce one copy (i.e., 21 cm (width A-4 paper) + distance between the end of one copy and the beginning of the next copy).



- 12. The evaluation conditions in the present application are more severe than those used in Suzuki, and this is the main reason for the difference in black spot formation. By using a sulfur-containing antioxidant in the photosensitive layer in accordance with the present invention, the resultant photoreceptor has excellent durability.
- 13. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.
 - 14. Further deponent saith not.

even in the 50,000th image in the Suzuki Examples.

Signature

Signature

4. 2002

Date